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EXAMINER	
YOUNG, NATASHA E	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/571,247	PORSCHA, PETER	
	Examiner	Art Unit	
	NATASHA YOUNG	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 March 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 13-15, 17-19, and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lillie (US 470,060) in view of Kessler et al (US 3,849,232) and Shipley (US 5,054,547).

Regarding claim 13, Lillie et al discloses a liquid distributor for two liquid phases to be distributed uniformly into a plurality of tubes of an upright tube-bundle reactor for carrying out chemical reactions (see page 1, lines 20-29 and figure 1), wherein the liquid distributor comprises the tubes (b) are retained at the top and bottom by tube sheets (p', p) and closed against the outside of the tube (see figure 1 and page 1. lines 46-69 and line 79 through page 2, line 23), and wherein a distribution chamber (D) is

arranged above the upper tube sheet (p'), wherein a distribution (G) chamber is arranged above the upper tube sheet (p'); wherein a first liquid distribution system is arranged above the tube sheet (p') or on it, which a first system is connected to at least one outer feed device (v'); and a second liquid distribution system is arranged above the first liquid distribution system, which system is connected to at least one other outer feed device (v') and contains one upper and one lower distribution tray (D', p^2), wherein the lower distribution tray (p^2) contains a plurality of openings (g) which are arranged flush above the first liquid distribution system, and exhibits at least one device for setting a uniform liquid level above the openings, wherein the upper distribution tray (D') is connected to the feed device (v') for liquid, and contains a plurality of overflow weirs or plate holes from which the liquid is able to discharge into the lower distribution tray (p^2), and wherein each of the overflow weirs is assigned to a plurality of openings in the lower distribution tray (see page 1, line 35 through page 2, line 23 and figure 1).

Lillie does not disclose wherein a distribution chamber is arranged above the upper tube sheet, which chamber contains feed pipes for two different liquids and at least one gas phase; wherein a first liquid distribution system which contains a weir, installed outside the tubed area, with openings at the bottom and a plurality of inlet sleeves, wherein one inlet sleeve is assigned at the top to each of the tubes in the tube bundle, the inlet sleeves are of tubular design and are vertically aligned, and the said sleeves have at least one lateral and one further opening located above the tube sheet and are open at the bottom facing each assigned tube in the tube bundle; and wherein the lower distribution tray of the second liquid distribution system contains a plurality of

openings which are arranged flush above the inlet sleeves of the first liquid distribution system.

Kessler et al discloses a trough (6) is arranged above the tube sheet (1), which the trough (6) contains feed pipes (7) for two different liquids and at least one gas phase (see column 2, lines 22-32) and the lower distribution tray of the second liquid distribution system contains a plurality of openings which are arranged flush above the inlet sleeves of the first liquid distribution system (see figures 1-2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Lillie with the teachings of Kessler et al such that the lower distribution tray of the second liquid distribution system contains a plurality of openings which are arranged flush above the inlet sleeves of the first liquid distribution system in order to achieve adequate uniformity (see Kessler et al column 3, lines15-28).

Shipley et al discloses wherein a first liquid distribution system which contains a weir, installed outside the tubed area, with openings at the bottom and a plurality of inlet sleeves (26), wherein one inlet sleeve is assigned at the top to each of the tubes (24) in the tube bundle, the inlet sleeves are of tubular design and are vertically aligned, and the said sleeves have at least one lateral and one further opening (36) located above the tube sheet (16) and are open at the bottom facing each assigned tube in the tube bundle (see column 3, line 41 through column 4, line 64 and figures 1-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Lillie with the teachings of Shipley such

that a first liquid distribution system which contains a weir, installed outside the tubed area, with openings at the bottom and a plurality of inlet sleeves, wherein one inlet sleeve is assigned at the top to each of the tubes in the tube bundle, the inlet sleeves are of tubular design and are vertically aligned, and the said sleeves have at least one lateral and one further opening located above the tube sheet and are open at the bottom facing each assigned tube in the tube bundle in order to improved distribution through the tubes.

Regarding claim 14, Lillie does not disclose a liquid distributor wherein the inlet sleeves exhibit at least one lower, smaller lateral hole and at least one higher, larger lateral hole.

Shipley discloses a plurality of passageways (36) and the location of the passageways vary (see column 4, lines 7-64 and figures 2-6).

It would have been an obvious matter of design choice to have a smaller hole and a larger hole in the inlet sleeve, since applicant has not disclosed that having a smaller hole and a larger hole in the inlet sleeve solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a smaller hole and a larger hole in the inlet sleeve.

It would have been obvious to one having ordinary skill I the art at the time the invention was made to have the inlet sleeves exhibit at least one lower, smaller lateral hole and at least one higher, larger lateral hole, since it has been held that rearranging parts of an invention involved only routine skill in the art (see MPEP 2144.04 (VI-C)).

Regarding claim 15, Lillie does not disclose a liquid distributor wherein the inlet sleeves exhibit at least one lateral notch through which liquid is able to flow from the tube sheet into the inside of the tube.

Shipley discloses a liquid distributor wherein the inlet sleeves exhibit at least one lateral notch through which liquid is able to flow from the tube sheet into the inside of the tube (see column 3, line 41 through column 4, line 64 and figures 3 and 5).

Regarding claim 17, Lillie does not disclose a liquid distributor wherein the upper liquid distribution system rests on the inlet sleeves of the lower liquid distribution system.

Kessler discloses the upper liquid distribution system is directly above the tube sheet (1) and the tubes (11) (see figures 1-2).

It would have been obvious to choose the upper liquid distribution system to rest on the inlet sleeves of the lower liquid distribution system from a finite number of identified, predictable solutions for ways to distribute a liquid, i.e., it would have been "obvious to try" the specific structure of the upper liquid distribution system resting on the inlet sleeves of the lower liquid distribution system to enhance uniform liquid distribution.

Regarding claims 18-19, Lillie and Shipley do not disclose a liquid distributor wherein it is dismountable and of modular structure.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a liquid distributor dismountable and of modular structure; and the individual parts can be plugged in, since it has been held that constructing a

formerly integral structure in various elements involves only routine skill in the art (see MPEP 2144.04 (V-C)).

Regarding claim 21, Lillie does not disclose a liquid distributor wherein the lower distribution tray is provided with overflow weirs or plate holes, each of which exhibit three outlets offset by 120 degrees, which outlets are each assigned flush to an inlet sleeve.

Kessler et al discloses liquid distributor wherein the lower distribution tray is provided with overflow weirs or plate holes, each of which exhibit three outlets offset by 120 degrees, which outlets are each assigned flush to a tube (see column 2, lines 33-41 and column 3, lines 29-44).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Lillie with the teachings of Kessler et al such that the lower distribution tray is provided with overflow weirs or plate holes, each of which exhibit three outlets offset by 120 degrees, which outlets are each assigned flush to a tube in order to provide liquid to a tube.

Regarding claim 22, Lillie discloses a liquid distributor wherein the lower distribution tray is provided with discharge flow aids (c) at its openings (see figure 1 and page 1, line 79 through page 2, line 23).

Regarding claim 23, Lillie does not disclose a liquid distributor wherein the inlet sleeves are positively connected to the tube sheet and the tubes.

Shipley discloses a liquid distributor wherein the inlet sleeves are positively connected to the tube sheet and the tubes (see column 4, lines 7-64 and figures 1 and 6).

Claims 16 and 24 rejected under 35 U.S.C. 103(a) as being unpatentable over Lillie (US 470,060), Kessler et al (US 3,849,232), and Shipley (US 5,054,547) as applied to claim 13 above, and further in view of Green et al (US 5,217,065).

Regarding claim 16, Lillie and Shipley do not disclose a liquid distributor wherein wire-shaped flow aids are provided in the at least one lateral notch of the inlet sleeves, down which such aids the liquid is able to run on the inside of the inlet sleeves.

Green et al discloses an apparatus (20) having pipes (22) extending along the length of a drum (24); one or more feeder tubes (26) are positioned above and parallel to pipes (22); and the feed tubes (26) comprise an inner tube (40) with an opening (48), an outer tube (42) with an opening (50), and a mesh (44) provide between the inner and outer tubes (see column 2, line 35 through column 3, line 32 and figures 3-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Lillie, Kessler et al, and Shipley with the teachings of Green et al such that wire-shaped flow aids are provided in the at least one lateral notch of the inlet sleeves, down which such aids the liquid to be able to run on the inside of the inlet sleeves in order to improve heat transfer.

Regarding claim 24, Lille and Shipley do not disclose a liquid distributor wherein the inlet sleeves are rolled into the tube ends.

Green et al discloses the inlet sleeves are rolled into the tube ends (see column 2, line 35 through column 3, line 32 and figures 5-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Lillie, Kessler et al, and Shipley with the teachings of Green et al such that the inlet sleeves are rolled into the tube ends for the predictable result of improving flow.

Claims 13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lillie (US 470,060) in view of Kessler et al (US 3,849,232), Van Hasselt et al (WO 02/070120 A1), and Shipley (US 5,054,547).

Regarding claim 13, Lillie et al discloses a liquid distributor for two liquid phases to be distributed uniformly into a plurality of tubes of an upright tube-bundle reactor for carrying out chemical reactions (see page 1, lines 20-29 and figure 1), wherein the tubes (b) are retained at the top and bottom by tube sheets (p', p) and closed against the outside of the (see figure 1 and page 1. lines 46-69 and line 79 through page 2, line 23), and wherein a distribution chamber (D) is arranged above the upper tube sheet (p'), wherein a distribution (G) chamber is arranged above the upper tube sheet (p'); wherein a first liquid distribution system is arranged above the tube sheet (p') or on it, which system is connected to at least one outer feed device (v'); and a second liquid distribution system is arranged above the first liquid distribution system, which system is connected to at least one other outer feed device (v') and contains one upper and one lower distribution tray (D', p^2), wherein the lower distribution tray (p^2) contains a plurality

of openings (g) which are arranged flush above the first liquid distribution system, and exhibits at least one device for setting a uniform liquid level above the openings, wherein the upper distribution tray (D') is connected to the feed device (v') for liquid, and contains a plurality of overflow weirs or plate holes from which the liquid is able to discharge into the lower distribution tray (p^2), and wherein each of the overflow weirs is assigned to a plurality of openings in the lower distribution tray (see page 1, line 35 through page 2, line 23 and figure 1).

Additionally, Van Hasselt et al discloses an upper distribution tray (9) contains an overflow weir (12) and the weir (12) is assigned to a plurality of openings in the lower distribution tray (8) (see page 8, lines 9-21 and figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a plurality of overflow weirs, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art (see MPEP 2144.04 (VI-B)).

Therefore, because these two upper distribution trays were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute an upper distribution tray with overflow weirs for an upper distribution tray with plate holes.

Lillie does not disclose wherein a distribution chamber is arranged above the upper tube sheet, which chamber contains feed pipes for two different liquids and at least one gas phase; wherein a first liquid distribution system which contains a weir, installed outside the tubed area, with openings at the bottom and a plurality of inlet

sleeves, wherein one inlet sleeve is assigned at the top to each of the tubes in the tube bundle, the inlet sleeves are of tubular design and are vertically aligned, and the said sleeves have at least one lateral and one further opening located above the tube sheet and are open at the bottom facing each assigned tube in the tube bundle; and wherein the lower distribution tray of the second liquid distribution system contains a plurality of openings which are arranged flush above the inlet sleeves of the first liquid distribution system.

Kessler et al discloses a trough (6) is arranged above the tube sheet (1), which the trough (6) contains feed pipes (7) for two different liquids and at least one gas phase (see column 2, lines 22-32) and the lower distribution tray of the second liquid distribution system contains a plurality of openings which are arranged flush above the inlet sleeves of the first liquid distribution system (see figures 1-2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Lillie with the teachings of Kessler et al such that the lower distribution tray of the second liquid distribution system contains a plurality of openings which are arranged flush above the inlet sleeves of the first liquid distribution system in order to achieve adequate uniformity (see Kessler et al column 3, lines15-28).

Shipley et al discloses wherein a first liquid distribution system which contains a weir, installed outside the tubed area, with openings at the bottom and a plurality of inlet sleeves (26), wherein one inlet sleeve is assigned at the top to each of the tubes (24) in the tube bundle, the inlet sleeves are of tubular design and are vertically aligned, and

the said sleeves have at least one lateral and one further opening (36) located above the tube sheet (16) and are open at the bottom facing each assigned tube in the tube bundle (see column 3, line 41 through column 4, line 64 and figures 1-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Lillie with the teachings of Shipley such that a first liquid distribution system which contains a weir, installed outside the tube area, with openings at the bottom and a plurality of inlet sleeves, wherein one inlet sleeve is assigned at the top to each of the tubes in the tube bundle, the inlet sleeves are of tubular design and are vertically aligned, and the said sleeves have at least one lateral and one further opening located above the tube sheet and are open at the bottom facing each assigned tube in the tube bundle in order to improved distribution through the tubes.

Regarding claim 20, Lillie does not disclose a liquid distributor wherein the overflow weirs of the upper distribution tray of the second liquid distribution system exhibit a serrated shape on its upper edge or lower edge, or both.

Van Hasselt discloses the overflow weirs of the upper distribution tray of the second liquid distribution system exhibit a serrated shape on its upper edge or lower edge, or both (see figure 1).

Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mucic et al (US 5,004,043) in view of Bouvin (US 4,133,485), Manteufel (WO 03/053563 A1, English Equivalent US 2005/0035473 A1), and Green et al (US 5,217,065).

Regarding claims 25-26, Mucic discloses an upright tubular reactor with an inlet (36) for the liquid or solution and an outlet (34) for liquid or liquid solution (see Abstract and figures 1-10).

Bouvin discloses an atomizing device for mixing or atomizing fluids (see Abstract); the invention permits the fabrication of apparatus of larger diameter in which the streams of fluids can be finely divided; the passages made available to then form a three-dimensional network having a multitude of meshes; and in the vertical position such an apparatus may constitute a column or tower which may advantageously be used for bringing into contact by counterflow a gas and a liquid, or two non-miscible liquids (see column 1, line 67 through column 2, line 6), which implies that the mesh allows for mixing of non-miscible liquids.

Manteufel discloses upper wires of the fabric or grid webs are assembled into certain groups in tubes or sleeves (see paragraph 0014).

Additionally, Green et al discloses an apparatus (20) having pipes (22) extending along the length of a drum (24); one or more feeder tubes (26) are positioned above and parallel to pipes (22); and the feed tubes (26) comprise an inner tube (40) with an opening (48), an outer tube (42) with an opening (50), and a mesh (44) provide between the inner and outer tubes (see column 2, line 35 through column 3, line 32 and figures 3-6) such that it would be obvious to use wires in tubes or sleeves for enabling heat transfer or for other applications.

The combination of the prior art elements of an upright tube-bundle reactor with wire assembled inside the tubes would have yielded the predictable result of mixing non-miscible liquids.

Although the combination of references disclose an apparatus, the process is rejected since the apparatus is capable of the process for two liquid phases to be uniformly distributed into a plurality of tubes of an upright tube-bundle reactor, the liquids being two liquids which cannot be mixed and which, because of their non-miscibility, cannot be pre-mixed, wherein the liquids are introduced separately into the individual tubes of the tube bundle; the process wherein not only the two liquids but also a gas flow is fed into the individual tubes of the tube bundle; and the process comprising uniformly distributing two immiscible liquids into a plurality of tubes of an upright tube-bundle reactor by separately introducing the liquids into the individual tubes of the tube bundle.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lillie (US 470,060) in view of Kessler et al (US 3,849,232), Van Hasselt et al (WO 02/070120 A1), Shipley (US 5,054,547), Bouvin (US 4,133,485), Manteufel (WO 03/053563 A1, English Equivalent US 2005/0035473 A1), and Green et al (US 5,217,065).

Regarding claim 27, Lillie et al discloses a liquid distributor for two liquid phases to be distributed uniformly into a plurality of tubes of an upright tube-bundle reactor for carrying out chemical reactions (see page 1, lines 20-29 and figure 1), wherein the tubes (b) are retained at the top and bottom by tube sheets (p', p) and closed against the outside of the (see figure 1 and page 1, lines 46-69 and line 79 through page 2, line

23), and wherein a distribution chamber (D) is arranged above the upper tube sheet (p'), wherein a distribution (G) chamber is arranged above the upper tube sheet (p'); wherein a first liquid distribution system is arranged above the tube sheet (p') or on it, which system is connected to at least one outer feed device (v'); and a second liquid distribution system is arranged above the first liquid distribution system, which system is connected to at least one other outer feed device (v') and contains one upper and one lower distribution tray (D', p^2), wherein the lower distribution tray (p^2) contains a plurality of openings (g) which are arranged flush above the first liquid distribution system, and exhibits at least one device for setting a uniform liquid level above the openings, wherein the upper distribution tray (D') is connected to the feed device (v') for liquid, and contains a plurality of overflow weirs or plate holes from which the liquid is able to discharge into the lower distribution tray (p^2), and wherein each of the overflow weirs is assigned to a plurality of openings in the lower distribution tray (see page 1, line 35 through page 2, line 23 and figure 1).

Additionally, Van Hasselt et al discloses an upper distribution tray (9) contains an overflow weir (12) and the weir (12) is assigned to a plurality of openings in the lower distribution tray (8) (see page 8, lines 9-21 and figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a plurality of overflow weirs, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art (see MPEP 2144.04 (VI-B)).

Therefore, because these two upper distribution trays were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute an upper distribution tray with overflow weirs for an upper distribution tray with plate holes.

Lillie does not disclose wherein a distribution chamber is arranged above the upper tube sheet, which chamber contains feed pipes for two different liquids and at least one gas phase; wherein a first liquid distribution system which contains a weir, installed outside the tubed area, with openings at the bottom and a plurality of inlet sleeves, wherein one inlet sleeve is assigned at the top to each of the tubes in the tube bundle, the inlet sleeves are of tubular design and are vertically aligned, and the said sleeves have at least one lateral and one further opening located above the tube sheet and are open at the bottom facing each assigned tube in the tube bundle; and wherein the lower distribution tray of the second liquid distribution system contains a plurality of openings which are arranged flush above the inlet sleeves of the first liquid distribution system.

Kessler et al discloses a trough (6) is arranged above the tube sheet (1), which the trough (6) contains feed pipes (7) for two different liquids and at least one gas phase (see column 2, lines 22-32) and the lower distribution tray of the second liquid distribution system contains a plurality of openings which are arranged flush above the inlet sleeves of the first liquid distribution system (see figures 1-2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Lillie with the teachings of Kessler et al

such that the lower distribution tray of the second liquid distribution system contains a plurality of openings which are arranged flush above the inlet sleeves of the first liquid distribution system in order to achieve adequate uniformity (see Kessler et al column 3, lines15-28).

Shipley et al discloses wherein a first liquid distribution system which contains a weir, installed outside the tubed area, with openings at the bottom and a plurality of inlet sleeves (26), wherein one inlet sleeve is assigned at the top to each of the tubes (24) in the tube bundle, the inlet sleeves are of tubular design and are vertically aligned, and the said sleeves have at least one lateral and one further opening (36) located above the tube sheet (16) and are open at the bottom facing each assigned tube in the tube bundle (see column 3, line 41 through column 4, line 64 and figures 1-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Lillie with the teachings of Shipley such that a first liquid distribution system which contains a weir, installed outside the tube area, with openings at the bottom and a plurality of inlet sleeves, wherein one inlet sleeve is assigned at the top to each of the tubes in the tube bundle, the inlet sleeves are of tubular design and are vertically aligned, and the said sleeves have at least one lateral and one further opening located above the tube sheet and are open at the bottom facing each assigned tube in the tube bundle in order to improve distribution through the tubes.

The prior art references do not disclose uniformly distributing two immiscible liquids into a plurality of tubes of an upright tube-bundle reactor by separately introducing the liquids into the individual tubes of the bundle.

Bouvin discloses an atomizing device for mixing or atomizing fluids (see Abstract); the invention permits the fabrication of apparatus of larger diameter in which the streams of fluids can be finely divided; the passages made available to then form a three-dimensional network having a multitude of meshes; and in the vertical position such an apparatus may constitute a column or tower which may advantageously be used for bringing into contact by counterflow a gas and a liquid, or two non-miscible liquids (see column 1, line 67 through column 2, line 6), which implies that the mesh allows for mixing of non-miscible liquids.

Manteufel discloses upper wires of the fabric or grid webs are assembled into certain groups in tubes or sleeves (see paragraph 0014).

Additionally, Green et al discloses an apparatus (20) having pipes (22) extending along the length of a drum (24); one or more feeder tubes (26) are positioned above and parallel to pipes (22); and the feed tubes (26) comprise an inner tube (40) with an opening (48), an outer tube (42) with an opening (50), and a mesh (44) provide between the inner and outer tubes (see column 2, line 35 through column 3, line 32 and figures 3-6) such that it would be obvious to use wires in tubes or sleeves for enabling heat transfer or for other applications.

The combination of the prior art elements of an upright tube-bundle reactor with wire assembled inside the tubes would have yielded the predictable result of mixing non-miscible liquids.

Although the combination of references discloses an apparatus, the process is rejected since the apparatus is capable of the process for two liquid phases to be uniformly distributed into a plurality of tubes of an upright tube-bundle reactor, the liquids being two liquids which cannot be mixed and which, because of their non-miscibility, cannot be pre-mixed, wherein the liquids are introduced separately into the individual tubes of the tube bundle; the process wherein not only the two liquids but also a gas flow is fed into the individual tubes of the tube bundle; and the process comprising uniformly distributing two immiscible liquids into a plurality of tubes of an upright tube-bundle reactor by separately introducing the liquids into the individual tubes of the tube bundle.

Response to Arguments

Applicant's arguments, see Remarks, page 7, filed March 16, 2009, with respect to objection to the specification and claims 26-27 and 112 rejection of claims 13-24 have been fully considered and are persuasive. The objections of the specification and claims 26-27 and 112 rejection of claims 13-24 have been withdrawn.

Applicant's arguments filed March 16, 2009 have been fully considered but they are not persuasive.

The applicant argues that the plate (p^2) of Lille and the trough (6) of Kessler et al would separate the two immiscible liquids, thus preventing the feeding of a stoichiometric mixture to the individual reactor tubes (see pages 9-10).

The arguments of counsel cannot take the place of evidence in the record.

The examiner would like evidence showing that the plate and/or trough prevent the feeding of a stoichiometric mixture to the individual reactor tubes.

The applicant argues distribution problems with higher gas loads which could bend the small descending liquid stream to the individual tubes of the distributor disclosed by Kessler et al are avoided in the present invention.

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATASHA YOUNG whose telephone number is 571-270-3163. The examiner can normally be reached on Mon-Thurs 7:30 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. Y./
Examiner, Art Unit 1797

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797